THE USE OF MOBILE TECHNOLOGY APPLICATION AS AN INTERACTIVE SUPPORTING ONLINE LEARNING PLATFORM FOR THE SUBJECT OF DPB2033 (BUSINESS MATHEMATICS): A CASE STUDY ABOUT LEARNING PERSPECTIVE IN POLITEKNIK METRO JOHOR BAHRU (PMJB)

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ABSTRACT

The ability to understand basic concepts of calculation and problem solving is an extremely important skill in the subject of DPB2033 (Business Mathematics) at Polytechnic in Malaysia. This subject is classified as one of the difficult subjects among Polytechnic METro Johor Bahru (PMJB) students. The objectives of this study is to determine the use of mobile technology application as a supporting online learning platform, to determine the use of mobile technology application as an interactive online learning platform that ease for students and to enhance the use of mobile technology application that provide online learning platform towards the Industry Revolution 4.0. Research has been conducted through quantitative methods. A total of 36 students from DLS 2B and DIB 3A class in current semester (December 2018) were used as a sample through a pilot study. A descriptive analysis has been conducted to analyze the findings based on the survey questionnaire that being answered through Google form link. Result shows that mobile technology able to be a supporting learning platform for students to access notes, do extra exercises and quizzes, review past year collection exam papers and etc. Furthermore, most of the respondents are also agreed that mobile technology can be as an interactive learning platform that ease for students and may enhance the mobile usage by providing online learning platform towards Industry Revolution 4.0. It can be concluded that mobile technology application is useful for PMJB students who take the subject of DPB2033 (Business Mathematics).

Keywords: Mobile Technology Application; Online Learning Platform; Business Mathematics

INTRODUCTION

The integration of technology and mathematics education in terms of teaching and learning is being more vital to support the Industrial Revolutionary 4.0. Furthermore, in recent era, internet usage is increasingly needed and it has been expanded through the use of applications that help students and educators to perform their daily tasks in a short time period using small technological devices (tablets or smart phones) in anytime anywhere (Malemran et al, 2015).

With the growing availability and bandwidth of internet, it can make an online mathematics education become more interesting. The advantages of online content include access without local software installation, ease of distribution and updating for
developers, and permanent availability for users as long as the internet is accessible (Drijvers, 2015).

Therefore, the mobile technology application in teaching and learning or in other words is a mobile learning (M-learning), tend to be one of the effective support learning tools or aid which can provide flexible access from anywhere and convenient to be used by the students.

PROBLEM STATEMENT

DPB2033 (Business Mathematics) is one of the subject classified as difficult among the students of Polytechnic METRO Johor Bahru. This is evidenced by data obtained from (Examination Unit PMJB, 2019) which is the total number of students scored 49-0 for final exam have been increased by 16.67% from semester Dec 2017 (15 students) until June 2018 (18 students).

The difficulties here are due to several factors such as there are students who are Less interested in computational subjects, less skilled with basic mathematical concepts from the point of solving simultaneous equations and less understanding the mathematical sentences for problem solving. According to (Erikson, 1999; Boaler, 1998), skilled students who can read mathematical sentences will be able to understand mathematically well.

Therefore, the use of mobile technologies can support the current method of teaching and learning and may reduce the difficulty of students to understand the subject of DPB2033 (Business Mathematics). The characteristics of mobile devices such as availability, portability, access to the Internet and wide acceptance among youngsters have made it an emerging tool to expand learning process occurred beyond the walls of the class (Borba et al, 2016).

There are three objectives of this research study. The first aim of this study is to determine the use of mobile technology application as a supporting learning platform. Further, this research study is focusing to determine the use of mobile technology
application as an interactive learning platform that ease for students and the last aim for this research is to enhance the use of mobile technology application that provides online learning platform towards Industry Revolution 4.0.

CONCEPTUAL FRAMEWORK

According to (Drijvers, 2015) stated that the use of mobile technology in mathematics education should not focusing only towards the effectiveness of the application tool, but should include the educational context as a whole which have being embedded in the teaching and learning method.

Therefore, the conceptual framework have been constructed as per below;

![Conceptual Framework](image)

**Figure 2: Conceptual Framework**

RESEARCH METHODOLOGY

*Pilot Study*

Referring to the Krejcie and Morgan Table (Krejcie & Morgan, 1970), a pilot study have been conducted towards a total of 36 students of Politeknik METRo Johor Bahru from class DLS 2B and DIB 3A, who enroll the subject of Business Mathematics (DPB 2033) in current semester (December 2018). They have been selected to test the proposed mobile application, PolyBizMath.

Besides that, seven expertise in subject Business Mathematics (DPB 2033) which consists one of the book writer from Politeknik Seberang Prai and senior lecturers from Politeknik METRo Johor Bahru, Politeknik Mersing and Politeknik Nilai also were used as a sample for the researcher to gain the primary data.

Details about the proposed mobile application (PolyBizMath)

PolyBizMath is a mobile application that being developed based on the subject DPB2033 (Business Mathematics), especially for Malaysian Polytechnic students who take various courses in the Commerce Department of Commerce. The content is organized according to the topic in the curriculum syllabus.

A summary of the notes and formulas uploaded in this app is based on the references from the book in the market such as Business Mathematics (Polytechnic Series), Business Mathematics for UiTM and Mathematics for Economics and Business (Sixth Edition). In addition, extra exercises and quizzes are based on questions developed by PMJB lecturers in accordance with the prescribed curriculum syllabus.

Furthermore, this application provides answer schemes for additional exercises and a collection of final exam questions starting from Dec 2016 until June 2018. Students have been given the opportunity to upload working methods and answers as
well. Meanwhile, lecturer can review the student’s submission and make a discussion in class. The content of this application can be improved from time to time based on the suggestions from students.

Survey Questionnaire

After being tested to use the mobile application, the respondents will state their reviews and recommendations by answering a set of survey questionnaire. A set of survey questionnaire with 10 questions based on the objectives have been answered by the expertise through a link of Google Form.

The questionnaires have been constructed based on questions in a journal of teacher’s perception about using mobile phones and laptops in education as mobile learning tools (Sad & Goktas, 2014). However, the questionnaires have been modified according to the type of respondents and preferences.

Results

Results from Students Class DLS 2B and DIB 3A

Reliability Test

Reliability test has been conducted towards the survey instruments and found that Cronbach’s Alpha value is 0.9796 as given in Table 1. Further, each of the 3 items also has been tested and the Cronbach’s Alpha value is above 0.90. According to (Sekaran & Bougie, 2016) reliabilities less than 0.60 are considered to be poor, those in the 0.70 range, acceptable, and those over 0.80 is good. Therefore, a range of 0.90 above indicates that the strength among all the items is extremely good.

Table 1: Reliability Test

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>No. of item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9796</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2: Reliability Test for each 3 items

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>No. of item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.959</td>
<td>3</td>
</tr>
<tr>
<td>0.908</td>
<td>3</td>
</tr>
<tr>
<td>0.940</td>
<td>3</td>
</tr>
</tbody>
</table>

Descriptive Analysis

Based on this study, the data will be analyzed through Descriptive Analysis.

Table 3: Descriptive Analysis for items based on Independent Variable 1 (IV 1)

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Mean</th>
<th>Average Total Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>I can improve my calculation skills in Business Math easily by using PolyBizMath.</td>
<td>3.11</td>
<td>3.17</td>
</tr>
<tr>
<td>A2</td>
<td>I can memorize the formulas in Business Math quickly by using PolyBizMath.</td>
<td>3.17</td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>I can increase my understanding towards Business Math problems solving by using PolyBizMath.</td>
<td>3.22</td>
<td></td>
</tr>
</tbody>
</table>
Result from Table 3 shows that most of the respondents are agree they can increase their understanding to solve Business Math problems and memorize the formulas quickly by using PolyBizMath. Therefore, it can be concluded that PolyBizMath able to be a platform for students to access notes, do extra exercises and quizzes, review past year collection exam papers and etc.

Table 4: Descriptive Analysis for items based on Independent Variable 2 (IV 2)

<table>
<thead>
<tr>
<th>No.</th>
<th>Questions</th>
<th>Mean</th>
<th>Average Total Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>PolyBizMath makes it easy for me to access the notes quickly.</td>
<td>3.28</td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>PolyBizMath makes it easy for me to increase understanding on problem solving skills with the provided additional exercises.</td>
<td>3.11</td>
<td>3.18</td>
</tr>
<tr>
<td>B3</td>
<td>PolyBizMath makes it easy for me to improve my calculation skills with the provided quizzes.</td>
<td>3.14</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 4, most of the respondents agree that PolyBizMath makes it easy for them to access the notes quickly and improve their calculation skills from the provided quizzes. It stated that PolyBizMath is an interactive learning platform through internet usage by using mobile application that ease for students.

Table 5: Descriptive Analysis for items based on Independent Variable 3 (IV 3)

<table>
<thead>
<tr>
<th>No.</th>
<th>Questions</th>
<th>Mean</th>
<th>Average Total Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>PolyBizMath is an online education application that supports teaching and learning methods in classroom.</td>
<td>3.11</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>PolyBizMath is an online education application that provide interactive learning.</td>
<td>3.11</td>
<td>3.11</td>
</tr>
<tr>
<td>C3</td>
<td>PolyBizMath is an online education application that support towards development of the revolutionary 4.0 industry.</td>
<td>3.11</td>
<td></td>
</tr>
</tbody>
</table>

A finding in Table 5 shows most of the respondents are agree that PolyBizMath may encourage interactive online learning by using mobile technologies towards Industry Revolution 4.0.

Table 6: Descriptive Analysis for Overall Items

<table>
<thead>
<tr>
<th>No.</th>
<th>Questions</th>
<th>Mean</th>
<th>Average Total Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Overall, PolyBizMath is useful for PMJB students.</td>
<td>3.28</td>
<td>3.28</td>
</tr>
</tbody>
</table>
Overall, it can be conclude that majority of the respondents are agree that PolyBizMath is useful for PMJB students.

RESULTS FROM EXPERTISE
All of the seven expertise are agree that the proposed mobile application, PolyBizMath is useful for Polytechnic Students. This is based on Descriptive Analysis for overall items that contribute towards highest average total mean, 3.86.

There were several recommendations provided from the expertise that need to be upgrade by the researcher for the improvement of the mobile application.

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